AMENDMENTS TO THE CLAIMS

Please add Claims 13-18.

1 (original): A metal nanoparticle dispersion usable for layered coating by spraying in the form of fine droplets,

wherein

an average particle size of said metal nanoparticles is selected in the range of 1 to 100 nm;

the metal nanoparticle dispersion is a dispersion comprising said metal nanoparticles uniformly dispersed, as a solid component, in a dispersion solvent;

the surface of the metal nanoparticle is coated with one compound or more which has a group containing a nitrogen, oxygen or sulfur atom and capable of coordinate-bonding by lone pairs existing in these atoms as a group capable of coordinate-bonding to a metal element contained in the metal nanoparticle;

said one or more compounds having the group containing the nitrogen, oxygen or sulfur atom is contained in a total amount of 10 to 50 parts by weight based on 100 parts by weight of said metal nanoparticles;

said dispersion solvent is a type of organic solvent or a mixed solvent of two or more organic liquids, which shows homogeneous liquid state at least at a temperature of 15°C or higher, wherein the type of organic solvent or at least one of the two or more organic liquids, which composes the dispersion solvent, has affinity for said one compound or more having the group containing the nitrogen, oxygen or sulfur atom;

a fluid viscosity (20°C) of the dispersion solvent is chosen from 10 mPa· s or lower;

in said metal nanoparticle dispersion, a volume percentage of said dispersion solvent is selected in the range of 55 to 80% by volume, and a fluid viscosity (20°C) of the metal nanoparticle dispersion is chosen in the range of 2 mPa· s to 30 mPa· s; and

a concentrated dispersion that is formed by concentration such that a part of the dispersion solvent contained in said metal nanoparticle dispersion is removed by evaporating so to set a volume percentage of said dispersion solvent in the range of 20 to 50% by volume comes to be a viscous concentrated solution having a fluid viscosity (20°C) being within the range of 20 Pa· s to 1000 Pa· s.

2 (original): The metal nanoparticle dispersion claimed in claim 1,

wherein the average particle size of said metal nanoparticles is selected in the range of 1 to 20 nm, and in the metal nanoparticle dispersion, the content of metal nanoparticles is chosen up to 40% by weight or more.

3 (original): The metal nanoparticle dispersion claimed in claim 1,

wherein the metal nanoparticle is a metal nanoparticle made of a metal selected from the group consisting of gold, silver, copper, platinum, palladium, tungsten, nickel, tantalum, bismuth, lead, indium, tin, zinc, titanium and aluminum, or a metal nanoparticle composed of an alloy of two or more metals selected from the group of metals.

4 (original): The metal nanoparticle dispersion claimed in claim 1,

wherein as for said one type of the organic solvent or the two or more types of organic liquids that compose the dispersion solvent, at least one of those is an organic solvent of which a melting point is 20°C or lower and a boiling point is within the range of 80 to 300°C.

5 (original): The metal nanoparticle dispersion claimed in claim 1,

wherein said dispersion solvent is a type of organic solvent or a mixed solvent of two or more organic liquids, which has such a high solvency that 50 parts by weight or more of the compound having the group containing the nitrogen, oxygen or sulfur atom, which is used for covering the metal nanoparticle surface, can be dissolved per 100 parts by weight of the dispersion solvent when heated up to 100°C or higher.

6 (original): A process for forming, on a substrate, an electroconductive layer with good conductivity having a fine shape, which is consisting of a sintered product layer of metal nanoparticles using the metal nanoparticle dispersion as claimed in claim 1,

wherein the sintered product layer contains a region in which a layer thickness is set up to 1 μm or more and a ratio of thickness/width of the layer shows a high aspect ratio of 1/4 or higher,

the process comprising the steps of:

forming a layered coating film, the thickness of which exceeds the layer thickness of said sintered product layer for the region showing said high aspect ratio by repeating multiple times the treatment of providing a coating layer having coating film thickness set in the range of 0.1 μm each time by discharging said metal nanoparticle dispersion in the form of fine droplets onto the planar pattern of fine shape, and

forming a sintered product layer of the metal nanoparticles by carrying out the treatment for baking the metal nanoparticles contained in the layered coating film of the metal nanoparticle dispersion,

wherein, in the step of forming said layered coating film, after the metal nanoparticle dispersion is discharged in the form of fine droplets, in the course of the fine droplets coming into impact on the surface to be coated, a part of the dispersion solvent included in the fine droplets is evaporated, whereby concentrated droplets are coated to the surface,

the formation of the sintered product layer of metal nanoparticles is conducted by heating the coating layer up to a temperature being not higher than 300°C, and

when the heating is carried out for treatment of baking, the compound having the group containing the nitrogen, oxygen or sulfur atom that is used for covering the surface of the metal nanoparticle is separated from the metal nanoparticle surface and dissolved into the dispersion solvent having a high solvency, for which a type of organic solvent or mixed solvent of two or more organic liquids is used, and thereby surface contact of the metal nanoparticles is attained, whereby the metal nanoparticles are sintered with each other and the dispersion solvent is removed by evaporation.

7 (original): The process for forming an electroconductive layer according to claim 6,

wherein, in the step of forming the layered coating film by discharging said metal nanoparticle dispersion in the form of fine droplets, the method of discharging said metal nanoparticle dispersion in the form of fine droplets is selected from deposition or inkjet.

8 (original): The process for forming an electroconductive layer according to claim 6,

wherein the heat-treatment temperature used for forming the sintered product layer of metal nanoparticles is chosen in the range of 150°C to 300°C.

9 (original): The metal nanoparticle dispersion claimed in claim 1,

wherein said metal nanoparticles are gold nanoparticles, the average particle size of the metal nanoparticles is selected in the range of 1 to 20 nm, and

in the metal nanoparticle dispersion, the content of the metal nanoparticles is chosen up to 40% by weight or more.

10 (original): The metal nanoparticle dispersion claimed in claim 1,

wherein said metal nanoparticles are silver nanoparticles,

the average particle size of the metal nanoparticles is selected in the range of 1 to 20 nm, and

in the metal nanoparticle dispersion, the content of the metal nanoparticles is chosen up to 40% by weight or more.

11 (original): The process for forming an electroconductive layer according to claim 8,

wherein the metal nanoparticles are nanoparticles made of a metal selected from the group consisting of gold, silver, copper, platinum and palladium.

12 (original): The process for forming an electroconductive layer according to claim 11,

wherein the metal nanoparticles are gold or silver nanoparticles, and

the average particle size of the metal nanoparticles is selected in the range of 1 to 20 nm.

13 (new): A metal nanoparticle dispersion usable for layered coating by spraying in the form of fine droplets and having a fluid viscosity (20°C) of 2 mPa·s to 30 mPa·s, comprising:

metal nanoparticles having an average particle size of 1 to 100 nm and having a surface coated with one or more compounds which contain a group containing a nitrogen, oxygen or sulfur atom and capable of coordinate-bonding by a lone pair existing in the atom to a metal element contained in the metal nanoparticles, said one or more compounds being contained in an amount of 10 to 50 parts by weight based on 100 parts by weight of said metal nanoparticles; and

a dispersion solvent in which the metal nanoparticles are uniformly dispersed, said dispersion solvent being composed of an organic solvent or two or more organic liquids, at least one of which has affinity to the one or more compounds having the group containing the nitrogen, oxygen or sulfur atom, said dispersion solvent showing homogeneous liquid state at least at a temperature of 15°C or higher and having a fluid viscosity (20°C) of 10 mPa·s or lower, wherein the dispersion solvent accounts for 55% to 80% by volume of the metal nanoparticle dispersion and is capable of evaporating while the metal nanoparticle dispersion is spraying to deposit in the form of droplets on a surface such that the dispersion solvent accounts for 20% to 50% by volume of the as-depositing droplets.

14 (new): The metal nanoparticle dispersion according to claim 13, wherein the as-depositing droplets have a fluid viscosity (20°C) of 20 Pa·s to 1000 Pa·s.

15 (new): The metal nanoparticle dispersion according to claim 13, wherein the average particle size of the metal nanoparticles is in the range of 1 to 20 nm, and the metal nanoparticles account for 40% by weight or more in the metal nanoparticle dispersion.

16 (new): The metal nanoparticle dispersion according to claim 13, wherein the dispersion solvent comprises at least one organic solvent having a melting point of 20°C or lower and a boiling point of 80 to 300°C.

17 (new): The metal nanoparticle dispersion according to claim 13, wherein the dispersion solvent has high solvency in which 50 parts by weight or more of the compounds having the group containing the nitrogen, oxygen or sulfur atom, can be dissolved per 100 parts by weight of the dispersion solvent when heated to 100°C or higher.

18 (new): The metal nanoparticle dispersion according to claim 13, wherein the metal nanoparticle is constituted by a metal selected from the group consisting of gold, silver, copper, platinum, palladium, tungsten, nickel, tantalum, bismuth, lead, indium, tin, zinc, titanium, aluminum, and an alloy of two or more metals of the foregoing.